MMR Vaccine Information on the Internet World Wide Web

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Abstract

Objectives: *To review world wide web sites that contain information about the MMR vaccine to determine whether the content is accurate compared to recognized standard sources of information. In today's internet age, patients search for information on the internet where there is no regulation of information quality.*

Methods: *By using an internet search engine, several combinations of search terms including "MMR vaccine" were used to find relevant web sites. Sites were classified as favoring MMR use, not favoring MMR use, no position on favoring MMR use. Adverse reactions described in the web site were classified as consistent with, or inconsistent with the adverse reactions described by the standard sources.*

Results: *13% to 40% of web sites favor MMR use depending on the search parameters used. 2.5% to 15% do not favor MMR use. 25% to 63% of the sites took no position on favoring MMR use. 45% to 70% of sites provided "consistent" information on adverse reactions, except for a search using "MMR Vaccine Dangers" which resulted in only 18% of the sites describing "consistent" adverse reaction information. 8% to 38% of sites provided information on adverse reactions which was inconsistent with standard sources, most of which involved information on autism.*

Conclusions: *Most sites do not take a stand on favoring MMR use. Most sites provide adverse reaction information consistent with the standard sources; however, it is likely that parents and patients will encounter sites that provide adverse reaction information, not consistent with standard sources.*

Introduction

Although childhood immunizations are highly beneficial in preventing many infectious diseases, practitioners must obtain parental consent to administer immunizations. Parents consent when they are convinced that the benefits of immunization outweigh the risks. Parents might question the importance of immunizations due to the rare occurrence within the United States. Ultimately, parents must decide whether or not to subject their child to such a risk.

In addition to obtaining information from their primary care provider, many parents often seek additional information that could help them determine what is best for their child. In the past, they might have gone to the library. In today's internet age, parents undoubtedly search for information on the internet's World Wide Web (WWW). A characteristic of the WWW is there is no regulation of what is posted on the internet. Anyone could post anything on the internet. The information parents obtain from the internet may not be entirely true. Most importantly, parents may not be able to determine the accuracy of this information.

The purpose of this study is to review web sites that contain information about the MMR (measles mumps rubella) vaccine and to determine whether or not the content is accurate based on the guidelines of the Advisory Committee on Immunization Practices (ACIP)[1], the Centers for Disease Control and Prevention (CDC)[1], and the American Academy of Pediatrics (AAP)[2], on the MMR vaccine.

Since the introduction of the monovalent measles, mumps, rubella vaccines, and now the combined MMR vaccine, cases of measles, mumps, rubella, and congenital rubella syndrome have shown a 99% decrease[1]. According to the guidelines set forth by publications and groups such as the ACIP, CDC, and AAP, the MMR vaccine is very safe. Most people who get the MMR vaccine have only mild reactions to it, while serious adverse reactions are extremely rare. Current recommendations for the MMR vaccine are 2 doses, the first at 12-15 months of age and the second at 4-6 years of age[1].

In 1998, Wakefield, et al published an article describing an association between MMR vaccine and chronic enterocolitis and regressive developmental disorder[3]. Since that time, concerns have been raised questioning whether MMR vaccine may have a causal relationship with the development of inflammatory bowel disease (IBD) and autism. Because of this association, many parents question the safety of the MMR vaccine.

However, according to statements put forth by the CDC[4] and the AAP[5,6], current scientific evidence does not support a causal relationship between the MMR vaccine and autism or inflammatory bowel disease (IBD)[2,3]. Epidemiological studies on MMR vaccine and the incidence of autism do not support causal associations between autism and the MMR vaccine. Also, several limitations in the Wakefield study have also led other researchers to discount the hypothesis that the vaccine causes autism[3].

Methods

In this study, we used the WWW Yahoo search engine (www.yahoo.com) to identify posted topics concerning the MMR vaccine. The terms selected to perform the search on Yahoo were chosen in an attempt to duplicate or predict possible terms that parents, guardians, or patients would probably use to search for information about the MMR vaccine. The search terms identified were:

1) MMR vaccine
2) MMR vaccine safety

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3) MMR vaccine side effects
4) MMR vaccine adverse reactions
5) MMR vaccine dangers
6) MMR vaccine controversy
7) MMR vaccine autism
8) MMR vaccine inflammatory bowel disease

The searches were done over a two month period in July and August 2001. The search identified thousands of possible sites concerning the MMR vaccine. We chose to review the top 40 sites of each search term based on a possible tendency by parents, guardians, or patients to view the first 40 sites before moving on to a new search term. We used the recommendations by the ACIP/CDC[1,4] and AAP[2,5,6] as "standard sources" of information guidelines to evaluate the sites if they fell within the parameters mentioned within the standard sources. These organizations and their publications are commonly used by practicing physicians as the authority on standard immunization practices.

Results

We constructed data tables that contained the following 5 categories (I to V):

I. Web site number: 40 sites reviewed per search.

II. Web site URL: The web site's URL (uniform resource locator) was recorded in order to keep track of the sites reviewed and to prevent any redundancy. Although there were attempts to keep the search list reproducible, the search engine reprioritizes the sequence of the URLs listed on different days even if the same search parameters are entered. In some instances, URL websites either varied in position, did not appear on the first 20 sites, or failed to appear at all in the first 40 sites on subsequent searches. Thus, we used the original URLs that were listed on the original search.

III. Does the site favor MMR use: In this category, there are 6 options used to analyze the web site: 1) yes, 2) no, 3) no position, 4) broken link, 5) link, or 6) message board.
   1) Yes: the site favors the use of the MMR vaccine.
   2) No: the site does not favor the use of the MMR vaccine.
   3) No position: the site did not advocate use or discourage use of the MMR vaccine.
   4) Broken link: at the time the URL was non-functional and no information was retrieved.
   5) Link: the site contained no information pertinent to our grading criteria other than links to other MMR sites.
   6) Message board: this site consists of a forum where opinions and feelings are displayed and it did not contain any information originating from the sites' hosts or authors.

IV. Adverse reactions: In this category, there were 7 options used to analyze the web site: 1) consistent, 2) inconsistent, 3) no mention, 4) broken link, 5) link, 6) message board, and 7) both sides.
   1) Consistent: the site is in agreement with the ACIP/CDC[4] and AAP[5,6] statements concerning possible reactions.
   2) Inconsistent: the site lists adverse events that have not been listed or proven under the statements provided by the ACIP/CDC and AAP.
   3) No mention: the site did not mention any adverse reactions. Broken link, link, and message board have been defined previously.
   4) Both sides: the site discusses the controversy between the MMR vaccine controversy, but it does not favor any particular side.

V. Notes: We listed what the specific inconsistency which may have been autism, IBD, or other for all sites that were inconsistent.

The results for these categories for each of the search parameters are summarized in tables 1 through 8.

A neutral WWW search such as "MMR vaccine" (table 1), results in 27.5% sites which favor MMR vaccine use. 10% do not favor MMR use, and 50% take no position on favoring MMR use. 50% of the sites provide adverse reaction information consistent with the standard sources (ACIP/CDC, AAP), while 20% are inconsistent. Adding the search terms "vaccine safety" (table 2) and "vaccine side effects" (table 3) resulted in higher percentages of sites favoring MMR vaccine use (40% and 55%, respectively), but similar percentages of sites providing adverse reaction information consistent with the standard sources.

Using the WWW search terms "vaccine adverse reactions" (table 4) and "vaccine dangers" (table 5), results in a decline in the percentage of sites favoring MMR use (15% and 12.5%, respectively). Using "vaccine adverse reactions" did not increase the percentage of inconsistent adverse reaction information sites, but using "vaccine dangers" did (37.5% of sites provided adverse reaction information inconsistent with the standard sources).

Using the WWW search terms "vaccine controversy" (table 6) did not result in any significant increase in the percentage of sites favoring MMR use or the percentage of sites providing adverse reactions information consistent with the standard sources.

For all of the search methods excluding those not mentioning autism and IBD specifically (tables 1 through 6), nearly all of the sites providing adverse reactions information inconsistent with the standard sources, provided information suggesting that autism was an adverse reaction and a few of these sites cited inflammatory bowel disease as an adverse reaction.

Using the WWW search terms "MMR vaccine autism" (table 7) results in 15% of sites favoring MMR use, 10% of sites not favoring MMR use, and 62.5% of sites taking no position on favoring MMR use. 52.5% of sites provided adverse reaction information consistent with the standard sources, while 32.5% provided adverse reaction information inconsistent with the standard sources. Consider that just because "autism" has been added to the search parameter, the search engine may find sites that contain information indicating that autism is caused by MMR, but the search engine may also find sites that contain information indicating that autism is NOT caused by MMR. Both types of sites fulfill the search criteria.

Using the WWW search terms "MMR vaccine inflammatory bowel disease" (table 8) results in 45% of sites favoring MMR use and 2.5% of sites not favoring MMR use. 70% of sites provided adverse reaction information consistent with the standard sources,

while only 7.5% provided adverse reaction information inconsistent with the standard sources.

Table 1.— Search term "MMR Vaccine"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	11/40 (27.5%)	Consistent	20/40 (50%)
No	4/40 (10%)	Inconsistent	8/40 (20%)
No position	20/40 (50%)	No mention	5/40 (12.5%)
Links	3/40 (7.5%)	Links	3/40 (7.5%)
Msg board	0/40 (0%)	Msg board	0/40 (0%)
Broken link	2/40 (5%)	Broken link	2/40 (5%)
		Both Sides	2/40 (5%)

8/8 "Inconsistent" sites described autism

Table 2.— Search term "MMR Vaccine Safety"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	16/40 (40%)	Consistent	19/40 (47.5%)
No	6/40 (15%)	Inconsistent	5/40 (12.5%)
No position	10/40 (25%)	No mention	6/40 (15%)
Links	5/40 (12.5%)	Links	5/40 (12.5%)
Msg board	1/40 (2.5%)	Msg board	1/40 (2.5%)
Broken link	2/40 (5%)	Broken link	2/40 (5%)
		Both Sides	2/40 (5%)

4/5 inconsistent sites described autism
1/5 inconsistent sites described autism and IBD

Table 3.— Search term "MMR Vaccine Side Effects"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	22 (55%)	Consistent	24 (60%)
No	6 (15%)	Inconsistent	9 (22.5%)
No position	8 (20%)	No mention	2 (5%)
Links	1 (2.5%)	Links	1 (2.5%)
Msg board	3 (7.5%)	Msg board	3 (7.5%)
Broken link	0 (0%)	Broken link	0 (0%)
		Both Sides	1 (2.5%)

7/9 inconsistent sites described autism
1/9 inconsistent sites described autism and IBD
1/9 inconsistent sites described other adverse reactions

Table 4.— Search term "MMR Vaccine Adverse Reactions"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	6/40 (15%)	Consistent	18/40 (45%)
No	3/40 (7.5%)	Inconsistent	9/40 (22.5%)
No position	21/40 (52.5%)	No mention	2/40 (5%)
Links	4/40 (10%)	Links	4/40 (10%)
Msg board	2/40 (5%)	Msg board	2/40 (5%)
Broken link	4/40 (10%)	Broken link	4/40 (10%)
		Both Sides	1/40 (2.5%)

6/9 inconsistent sites described autism
2/9 inconsistent sites described autism and IBD
1/9 inconsistent sites described other adverse reactions

Table 5.— Search term "MMRVaccine Dangers"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	5/40 (12.5%)	Consistent	7/40 (17.5%)
No	3/40 (7.5%)	Inconsistent	15/40 (37.5%)
No position	22/40 (55%)	No mention	2/40 (5%)
Links	8/40 (20%)	Links	8/40 (20%)
Msg board	1/40 (2.5%)	Msg board	1/40 (2.5%)
Broken link	1/40 (2.5%)	Broken link	1/40 (2.5%)
		Both Sides	6/40 (15%)

11/15 inconsistent sites described autism
1/15 inconsistent sites described autism and IBD
1/15 inconsistent sites described autism and other adverse reactions
1/15 inconsistent sites described autism and IBD and other adverse reactions
1/15 inconsistent sites described other adverse reactions

Table 6.— Search term "MMR Vaccine Controversy"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	10/40 (25%)	Consistent	13/40 (32.5%)
No	6/40 (15%)	Inconsistent	10/40 (25%)
No position	9/40 (22.5%)	No mention	1/40 (2.5%)
Links	9/40 (22.5%)	Links	9/40 (22.5%)
Msg board	2/40 (5%)	Msg board	2/40 (5%)
Broken link	4/40 (10%)	Broken link	4/40 (10%)
		Both Sides	1/40 (2.5%)

9/10 inconsistent sites described autism
1/10 inconsistent sites described autism and IBD

Table 7.— Search term "MMR Vaccine Autism"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	6/40 (15%)	Consistent	21/40 (52.5%)
No	4/40 (10%)	Inconsistent	13/40 (32.5%)
No position	25/40 (62.5%)	No mention	0/40 (0%)
Links	3/40 (7.5%)	Links	3/40 (7.5%)
Msg board	0/40 (0%)	Msg board	0/40 (0%)
Broken link	2/40 (5%)	Broken link	2/40 (5%)
		Both Sides	1/40 (2.5%)

12/13 inconsistent sites described autism
1/13 inconsistent sites described autism and IBD

Table 8.— Search term "MMR Vaccine Inflammatory Bowel Disease"

Does the site favor MMR vaccine use?		Adverse Reactions	
Yes	18/40 (45%)	Consistent	28/40 (70%)
No	1/40 (2.5%)	Inconsistent	3/40 (7.5%)
No position	12/40 (30%)	No mention	0/40 (0%)
Links	7/40 (17.5%)	Links	7/40 (17.5%)
Msg board	0/40 (0%)	Msg board	0/40 (0%)
Broken link	2/40 (5%)	Broken link	2/40 (5%)
		Both Sides	0/40 (0%)

1/3 inconsistent sites described autism
2/3 inconsistent sites described autism and IBD

Discussion

The percentages encountered in this study are meant to be approximate since the search results will change depending on the search parameters used, the search engine used and the date of the search.

This survey of web sites indicates that most sites do not take a stand in favoring MMR use. It is more common for sites to take no stand in this regard. This could be due to perceived liability. Most sites provide adverse reaction information consistent with the standard sources; however, there are many sites that provide information inconsistent with the standard sources. Physicians administering immunizations to children should be aware that there are many world wide web sources of information available to parents and patients. While most of them provide accurate information, it is fairly likely that parents and patients may encounter sites that provide adverse reaction information which is not consistent with standard sources.

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